## A. SIZE OF BALANCE WEIGHTS

The thickness of the weight shall be as follows:

| Thickness of Sideplate Or Attaching Part of Wheel | Thickness of Weight to be Attached |
|---|---|
| Up to 3/16" | Not over the thickness of the part to which it is attached |
| Over 3/16" | 3/16" or not over one-half the thickness of the part to which it is attached, whichever is greater. |

## B. LOCATION OF BALANCE WEIGHT (Except for Wheels having Balance Ring or Grooves)

The balance weight must be located at least one inch away from the edge or O.D. of the plate. It is to be fastened to the Sideplate, Centerplate, or Backplate only. (Except for the Series TVSR where it may be fastened to the Blade or Blade Gussett.)

## C. MATERIALS TO BE USED

If the weight is to be bolted on, any convenient steel material will be satisfactory. If Wheels are made of corrosion resistant materials, similar materials should be used for the balance weights and fasteners. See Figures 16.2-1 and 16.2-2 for sizing and method of fastening.

If the weight is to be welded on, the material must be the same as the plate to which is is to be welded, or compatible with it from a welding standpoint.

## D. METHOD OF FASTENING

Balance weights may be welded to most materials providing the proper welding procedure is used including electrode, pre-heat plate temperature, etc. It is the responsibility of the user to assure that the proper procedure is followed. Refer to the table below for recommendations, and to Section 1.2 Contract Data Sheets for Wheel material category.

## I. LOW CARBON STEEL

Steels included in this category are:

| (W) PDS | SAE or AISI No. | ASTM Spec. | Electrode |
|---|---|---|---|
| 10110 DT | | A284 Grd. D | E6014 |
| 10110 DS | | A201 Gr. B | E6014 |

The size of the weld is to be the same as the thickness of the weight. Preheat temperature must not be less than 80°F.

## II. LOW ALLOY STEEL

| (W) PDS | SAE or AISI No. | ASTM Spec. | Electrode |
|---|---|---|---|
| 10310 AC | | A302 B | E 7018-A1 |
| 10310 AE | 8620 | | E 7018-A1 |
| 10310 AG | | A302 B | E 7018-A1 |
| 10310 BK | 950 | A242 | E 7018 |
| 10310 BU | | A441 | E 7018 |
| 10310 FA | | A387 C | E 8018-B2 |
| 10301 AJ | | A606 Type 4 | E 7018 |

The size of the weld is to be the same as the thickness of the weight. Preheat temperature must be not less than 80°F. Interpass temperature (adjoining plate temperature) must not exceed 400°F.

## III. LOW ALLOY HIGH STRENGTH

Steels included in this category are:

| (W) PDS | SAE or AISI No. | ASTM Spec. | Electrode |
|---|---|---|---|
| 10310 BP | | A514 Gr. A, G, D, E | E 11018-M |

The size of the weld is to be the same as the thickness of the weight. Pre-heat temperature must not be less than 200°F. Interpass temperature (adjoining plate temperature) must not exceed 400°F.

## IV. SPECIAL HIGH STRENGTH

| (W) PDS | SAE or AISI No. | ASTM Spec. | Electrode |
|---|---|---|---|
| 10310 FJ | | A542 C1.2 | E 11018-M |

The size of the weld is to be the same as the thickness of the weight. Pre-heat temperature must not be less than 250°F. Interpass temperature (adjoining plate temperature) must not exceed 400°F. The base steel must be maintained above the minimum preheat temperature for eight (8) hours after welding.

**NOTE**

**To insure the integrity of the balance weight welds, magnaflux, dye check, or zyglo for cracks. Correct defects if indicated. As an alternate, balance weights may be fastened to the Wheel with bolts as follows:**

**Bolts are to be per American Standard ANSI B18.2.1. For temperatures up to 600°F, use Westinghouse PDS 70100 EA, ASTM A449, or ASTM A325 for the bolts and Westinghouse PDS 70210 BP or ASTM A194 Grade 1, or ASTM A325 for nuts. For 600°F to 900°F, use Westinghouse PDS 70100 DH, ASTM A193 Grade B7 for the bolts and Westinghouse PDS 70210 FD or ASTM A194 Grade 2H for the nuts. Use 1/2-13 nuts and bolts in all cases and torque the nuts to 75 foot/pounds. Refer to (Figure 16.2-1) to determine the number of bolts needed and attach the weight per Figure 16.2-2.**

## V. SPECIAL CORROSION RESISTANT

| Plate Specification |
|---|
| ASTM B443 [(W) 15110CL] |

| Electrode Specification |
|---|
| ASME SFA 5.11 ENiCrMo-3 [(W) 15165DE] |

The size of the finished weld is to be the same size as the thickness of the weight. Preheat temperature must not be less than 65°F. Interpass temperature (adjoining plate temperature) must not exceed 400°F.

**NOTE**

**To insure the integrity of the balance weight welds dye check for cracks. Correct defects if indicated.**

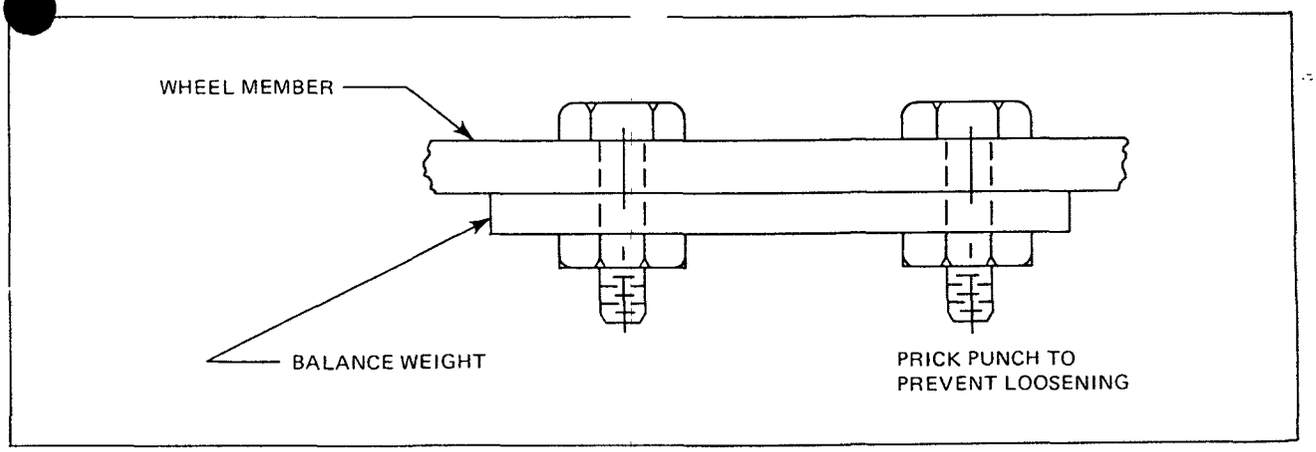



Fig. 16.2-1 *Typical Balance Weight Bolting*

STURTEVANT DIVISION
MECHANICAL ENGINEERING STANDARDS

BOLTS PER POUND OF BALANCE WEIGHT (1/2-13 BOLTS)

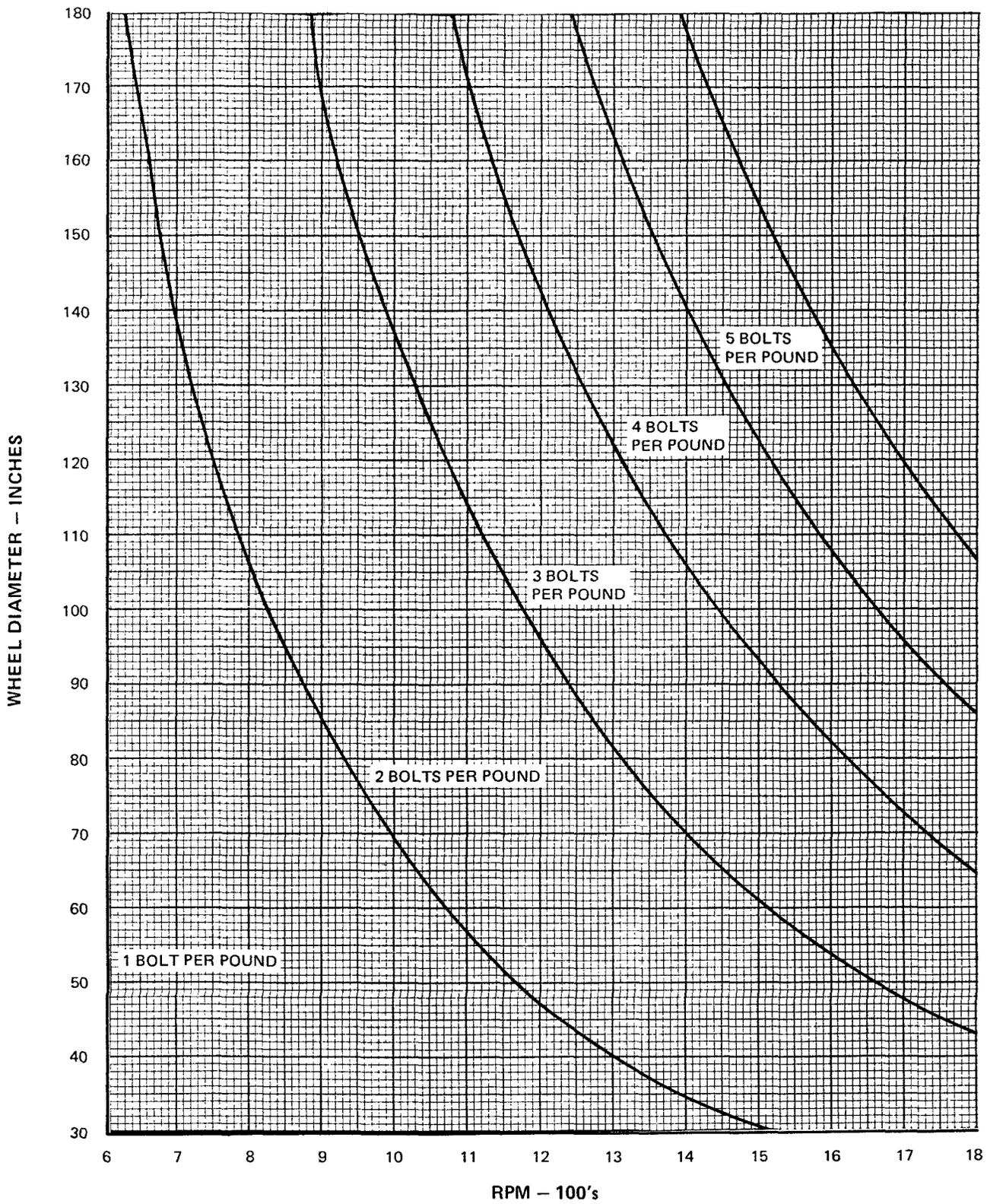



**Fig. 16.2-2** *Bolts per Pound of Balance Weight by Wheel Diameter vs Speed*

Effective January 1982

# Section 15.3 Start-Up Sequence



The following sequence should be followed when starting the Fan. This sequence contains the minimum requirements to be used and should be supplemented with plant system requirements and local safety code requirements.

**CAUTION**

**PRIOR TO INITIAL START-UP OF THE FAN, THE STEPS IN SECTION 15.2, INSTALLATION CHECK LIST, MUST BE FOLLOWED BEFORE PROCEEDING WITH START-UP PROCEDURE.**

15.3.1 Check and confirm the following (requirements):

a. Proper Oil level in Fan Bearings.

b. Oil level in Drive and Auxiliary Drive Train Bearings, etc.

c. Lubrication System(s) are operating properly.

**CAUTION**

**LUBRICATING OIL IN STEPS 15.3.1 a, b, AND c MUST BE AT THE PROPER LEVEL, TYPE, GRADE, OPERATING TEMPERATURE, AND BE FREE OF CONTAMINANTS BEFORE FAN IS OPERATED.**

d. All personnel, equipment, and foreign material are removed from the Fan and Fan System.

e. All access doors in the Fan and System are closed and secured.

f. All Fan dampers and/or Inlet Vane Controls are closed and linkages are properly connected and functioning.

g. All Safety Guards and Systems are securely in place and functioning properly.

h. Cooling medium to Fan Bearings and associated Drive Train(s) components are established and functioning properly.

j. All personnel and foreign objects are clear of any parts that will move such as Shafts, Damper and/or Inlet Vane Control Linkages, Controllers, Cooling Wheels, etc.

k. All personnel and foreign objects are clear of Inlets on Open Inlet Fans.

l. Establish Main Drive power source.

15.3.2 Start Fan.

15.3.3 Immediately check the following items:

a. Oil flow has been established in the Fan and Drive Train Bearings.

b. Vibration levels of the Fan and Drive Train are within the allowable operating range for the Fan RPM.

c. All Shaft Seals are free and not rubbing on Shaft.

d. Establish air flow by opening Dampers/Vanes to prevent friction heat build-up and thermal distortion of the Rotor.

**WARNING**

**IF ANY OF STEPS a THROUGH d ARE NOT MET, THE EQUIPMENT SHOULD BE SHUT DOWN IMMEDIATELY. FIND AND CORRECT THE CAUSE(S) BEFORE RESTARTING THE EQUIPMENT.**

15.3.4 Place Fan in normal operation mode when step 15.3.3 is satisfactory.

Effective January 1978

**Westinghouse Electric Corporation**

Sturtevant Division
Hyde Park, Boston, MA 02136

# WESTINGHOUSE STURTEVANT – TECHNICAL SERVICES

## INSTALLATION CHECKLIST/REPORT

I. GENERAL INFORMATION

Date of Inspection _____

A. Customer Data

1. Customer: _____
2. User: _____
3. Station/Plant: _____
4. Unit: _____
5. City, State: _____
6. G.O. and Item #: _____
7. Customer Fan ID: _____
8. Name and Title of Contact: _____
9. Possession by customer of proper dwgs. and installation books: _____
10. Reason for Inspection:
    a. Erection _____ (Sections I - IX, XII)
    b. New Installation Checkout/Inspection _____ (Sections I - IX, XII)
    c. Start-up _____ (Sections I - IX, XI, XII)
    d. Maintenance, Installation Checkout/Inspection _____ (Sections I - XII)
    e. Other _____
11. Note if Installation has been previously inspected by WSD _____ .
    Date _____

B. Fan Data

1. Size _____
2. Width: SWDI – DWDI
3. Duty _____
4. Arrangement: _____
5. Class/RPM _____
6. Rotation _____
7. Design Gas Temp. _____
8. Contract Dwg. No. _____
9. Driver:
    a. Type and Make _____
    b. Horsepower _____
    c. RPM _____

NOTE:

1. All deviations or deficiencies are to be detailed in the space provided on the last page of this report.
2. All required measurements are to be recorded in the space provided.
3. Record "OK" or "NG" in the space provided by each checkpoint where applicable. Draw line through space if checkpoint does not apply.

## II. FOUNDATION – SOLEPLATE – PEDESTALS

| | FIXED | FLOAT |
|---|---|---|
| A. Inspect for proper installation of soleplate/foundation shims. (Straddling anchor bolts as per WSD standards.) | ____ | ____ |
| B. Inspect interfaces of foundation - soleplate - pedestal. (Min. 80% contact.) | | |
| 1. Foundation - soleplate | ____ | ____ |
| 2. Soleplate - pedestal | ____ | ____ |
| C. Note configuration of foundations: | | |
| 1. Sloped (Note angles) | ____ | ____ |
| 2. Number of sides (sloped) | ____ | ____ |
| 3. Size of foundation pier's top surface | ____ | ____ |
| D. Inspect and check tightness of all fasteners: | | |
| 1. Pedestal to soleplate bolts | ____ | ____ |
| 2. Anchor bolts | ____ | ____ |
| E. Inspect and measure for proper minimum clearance between foundation and casing. (Note actual dimension.) | ____ | ____ |
| F. Verify installation of hardened steel washers on anchor and pedestal hold-down bolts. | ____ | ____ |

## III. BEARINGS

| | | |
|---|---|---|
| A. Specifications (Fixed and Float Bearings) | | |
| 1. Type | ____ | ____ |
| 2. Manufacturer | ____ | ____ |
| 3. Size | ____ | ____ |
| 4. Cooling Type | ____ | ____ |
| 5. Lubrication Type (Viscosity) | ____ | ____ |
| 6. Features and Details | ____ | ____ |
| B. General: All Type Bearings | | |
| 1. Inspect for any possible damage resulting from shipping and/or assembly. | ____ | ____ |
| 2. Inspect bearings for dirt and rust. | ____ | ____ |
| 3. Inspect lubricant for possible contamination. | ____ | ____ |
| 4. Inspect flexible connections in cooling lines (if applicable). | ____ | ____ |
| 5. Check for proper installation of shims under bearing housing. | ____ | ____ |
| 6. Inspect and check tightness of bearing housing hold-down bolts. | ____ | ____ |
| a. Verify installation of hardened steel washers under bolt head and nut. | ____ | ____ |
| 7. Check for proper alignment of bearing housing and shaft. | ____ | ____ |

| | FIXED | FLOAT |
|---|---|---|
| C. Sleeve Bearings: | | |
| 1. Check and record clearances: | | |
| a. Radial clearance (on 4 corners of sleeve). | _____ | _____ |
| b. Thrust collar-sleeve clearance. | _____ | _____ |
| 2. Inspect for proper installation and operation of bearing accessories. | _____ | _____ |
| 3. Check for proper oil level in bearing sump. | _____ | _____ |
| 4. Check for proper installation and fit of bearing seals around shaft. | _____ | _____ |
| 5. Applicable to SAWC and Dodge bearings: | | |
| a. Check for proper functioning of oil rings. | _____ | _____ |
| b. Inspect and tighten bearing adjusting bolts. | _____ | _____ |
| c. Inspect for water leakage of cooling connection. | _____ | _____ |
| d. Inspect for proper lower spherical seat - sleeve contact. | _____ | _____ |
| 6. Applicable to WSD H.D. bearings: | | |
| a. Check for proper installation of: | | |
| 1. Oil discs | _____ | _____ |
| 2. Oil scoops | _____ | _____ |
| 3. Orifice plate | _____ | _____ |
| b. Check for proper sleeve - bearing housing clearance. (Record actual dimension.) | _____ | _____ |
| c. Check for proper clearance of oil discs at: (Record actual dimensions.) | | |
| 1. Oil scoop | _____ | _____ |
| 2. Orifice plate | _____ | _____ |
| 3. Radial shelf | _____ | _____ |
| d. Check for proper installation of shims at bearing housing split. | _____ | _____ |
| 1. Thickness (Record actual dimensions) | _____ | _____ |
| D. Anti-Friction Bearings: | | |
| 1. Inspect for: | | |
| a. Looseness | _____ | _____ |
| b. Movement | _____ | _____ |
| 2. Check locking collar device for tightness | _____ | _____ |
| 3. Check for proper lubrication | _____ | _____ |
| 4. Inspect seals for proper installation and fit. | _____ | _____ |

| | FIXED | FLOAT |
|---|---|---|

IV. SHAFT

A. Visually inspect shaft for any damage resulting from shipping and/or job site handling. _____

B. Inspect shaft journals and thrust collars. _____ _____

C. Check and record distance between thrust collars. _____ _____

1. Check and record collar runout _____ _____

V. WHEEL

A. Check that the wheel installed is of the correct rotation. _____

B. Inspect for shipping and/or installation damage. _____

VI. HOUSINGS

A. Inspect for all required field welds. _____

B. Inspect for possible damage resulting from shipping and/or assembly. _____

C. Check for proper housing inlet/wheel alignment.

1. Record radial clearance between inlet and wheel:

a. _____ Inboard _____ b. _____ Outboard _____

2. Record axial clearance/overlap between inlet and wheel:

a. _____ Inboard _____ b. _____ Outboard _____

| | FIXED | FLOAT |
|---|---|---|

D. Inspect shaft seals for proper installation. _____ _____

1. Check for available clearance for expansion/contraction and freedom of movement. _____ _____

2. If seal is pressurized, check for proper air connections. _____ _____

| | MAIN DRIVE | AUX. DRIVE |
|---|---|---|
| **VII. COUPLING(S)** | | |
| A. Coupling type(s) and make(s). | _____ | _____ |
| B. Inspect for proper lubrication. | _____ | _____ |

C. Check and record alignment in cold condition:

1. Main Driver:

a. _____ Rim _____ b. _____ Face _____

2. Auxiliary Drive:

a. _____ Rim _____ b. _____ Face _____

D. Check and Record Face Gap.

a. Min _____ b. Max _____

E. Check for proper installation of distance plate (if applicable) _____

a. Record Thickness Dimension _____

| | FAN OUTLET | FAN INLET |
|---|---|---|
| **VIII. DUCTWORK CONNECTIONS** | | |
| A. Note if there are any sharp elbows within 50 ft. of fan. (Note distance/degree.) | _____ | _____ |
| 1. Note if elbows are equipped with turning vanes. | _____ | _____ |
| B. Note if there are any rapid duct expansions. | _____ | _____ |
| 1. Note dimensions of expansions, if applicable. | _____ | _____ |
| C. Expansion joints: | | |
| 1. Type | _____ | _____ |
| 2. Check for proper installation. | _____ | _____ |

NOTE: See additional Sections IX, X, XI, if applicable.

## IX. ADDITIONAL EQUIPMENT

### A. Packaged Lubricating Systems (If Applicable)

1. Source of lubrication _____
2. Inspect oil lines for the following:
   a. All lines flushed out _____
   b. Return lines pitched to WSD standards _____
   c. Possible oil leakage in all connections and lines _____
3. Check for contaminants in oil _____
4. Check interlocks between oil supply and main driver _____
5. Check interlocks between primary and auxiliary pumps _____
6. Check oil heater operation per specs _____
7. Check oil cooler operation per specs _____
   a. Note oil cooling system type _____
8. Visually inspect the following:
   a. Temperature gauge reading on lube console _____
   b. Pressure gauge reading on lube console _____
   c. Pressure of oil supply lines at flow control valve – Fixed _____ , Float _____
   d. Oil level in lube console as indicated by:
      1. Sight glass - static check _____
      2. Dip stick - operating check _____
   e. All piping and fittings for possible leakage _____
9. Inspect for unusual mechanical noises from:
   a. Pump and motor assembly(s) _____
   b. Fan and motor on air cooled heat exchanger(s) _____
10. Check proper operation of oil breather and filter _____
11. Verify open heater vent hole _____
12. Check for proper rotation of:
    a. Pump motor _____
    b. Fan on air cooled heat exchanger (if applicable) _____

B. Vane Control and Damper(s): Operation and Travel

1. Inlet Vanes (If Applicable)

   a. Visually inspect all exposed vane parts and linkage for possible shipping and/or assembly damage, and for freedom of movement. _____

   b. Check tightness of all fasteners _____

   c. Check for proper rotation of inlet vane(s) _____

   d. Check levers for proper size and orientation _____

   e. Measure operating shaft rotation (degrees) _____

   f. Check travel of actuator and linkage against the travel of vanes and linkage, and vane synchronization. _____

   g. Check for lubrication of external linkage bearings. _____

| | INLET | OUTLET |
|---|---|---|
| 2. Inlet and Outlet Dampers (If Applicable) | | |
| a. Visually inspect all exposed parts and linkages for possible shipping and/or assembly damage, and for freedom of movement. | _____ | _____ |
| b. Check for tightness of all fasteners. | _____ | _____ |
| c. Check internal parts for alignment and clearance. | _____ | _____ |
| d. Check for proper blade orientation of inlet and/or outlet dampers. | _____ | _____ |
| e. Check for proper rotation of inlet damper(s). | _____ | _____ |
| f. Check for lubrication on all bearings (if applicable) | _____ | _____ |
| g. Check travel of actuator and linkage against damper leaf and linkage travel. | _____ | _____ |
| h. Check synchronization of both inlet dampers (if applicable). | _____ | _____ |

IX. C. Turning Gear Assembly (If Applicable)

1. Inspect for:

   a. Proper alignment _____

   b. Tightness of all fasteners _____

   c. Proper rotation of over-running clutch assembly _____

   d. Proper rotation of turning gear motor _____

   e. Proper lubrication _____

   f. Main fan drive motor rotation (must be verified before connecting turning gear assembly _____

X. ADDITIONAL INSPECTION (Applicable only if fan has been in service.)

| | FIXED | FLOAT |
|---|---|---|
| A. Foundations | | |
| 1. Inspect the following for cracks or other significant damage: | | |
| a. Bearing Foundation(s) | _____ | _____ |
| b. Fan Foundation | _____ | _____ |
| B. Bearings | | |
| 1. Overall inspection of bearings for cracks, corrosion, leakage, wear, and contaminants. | _____ | _____ |
| 2. Inspect babbitt on sleeve bearings (if applicable) for wear, pitting, scoring, and looseness. | _____ | _____ |
| 3. Inspect bearing sleeve-housing spherical seat contact (if applicable). | _____ | _____ |
| 4. Inspect bearing seals for excessive wear and leakage. | _____ | _____ |
| 5. If anti-friction bearings are used, inspect for wear, looseness, and unusual mechanical noises. | _____ | _____ |

C. Shafts

1. Visually inspect shafts for wear, cracks, and corrosion. _____
2. Mechanically inspect for shaft runout. _____
3. Inspect shaft seals for excessive wear. _____

D. Wheels

1. Visually inspect all parts for wear, cracks, corrosion, erosion, and material build-up. _____
2. Inspect condition and tightness of rivets or studs. _____
3. Inspect for possible axial movement of wheel along shaft. _____

E. Housings

1. Inspect for cracks, corrosion, erosion, and material build-up. _____

F. Coupling(s)

1. Inspect for teeth wear: Main Driver_____, Aux. Driver_____

G. Vane Control and Damper(s)

1. Inspect all parts for wear, erosion, corrosion, and material build-up.

| | | |
|---|---|---|
| a. Inlet Vane Control(s) | _____ | _____ |
| b. Inlet Damper(s) | _____ | _____ |
| c. Outlet Damper(s) _____ | | |

XI. OPERATION (If fan is run at this time)

A. Bump fan and verify that wheel rotates in the proper direction. _____

B. Check bearing vibration amplitude and phase - as found initially.

1. Fixed Bearing: H_____, Ph_____, V_____, Ph_____, A_____, Ph_____
2. Float Bearing: H_____, Ph_____, V_____, Ph_____, A_____, Ph_____

C. Perform field balancing if required; record final readings:

1. Fixed Bearing: H_____, Ph_____, V_____, Ph_____, A_____, Ph_____
2. Float Bearing: H_____, Ph_____, V_____, Ph_____, A_____, Ph_____
3. Amount of weight added: IB_____, Center_____, OB_____

D. Check bearing temperature

1. Fixed _____
2. Float _____

E. Check bearing oil temperature

1. Fixed_____
2. Float_____

F. Verify operating integrity of bearing seals

1. Fixed_____
2. Float_____

G. Check bearing oil level as indicated by oil regulator (if applicable).

1. Fixed _____
2. Float _____

H. Auditory check for unusual mechanical noises. _____

I. Recheck for proper operation (if applicable)

1. Lube Unit _____
2. Inlet Dampers _____
3. Outlet Dampers _____
4. Inlet Vane Control _____

J. Inspect all Stuffing Boxes on Dampers for leakage (if applicable); tighten if necessary._____

## 1. COMMENTS

A. Comments and deviations from the above: _____

B. Note if inspection performed was not complete. _____

1. Reason _____

2. What components require further inspection. _____

3. Comment on what work is still necessary. _____

Dates of Job: _____

Certified by WSD Rep.: _____ Date: _____

Accepted By:

| Name | Title | Company | Date |
|---|---|---|---|
| | | | |
| | | | |

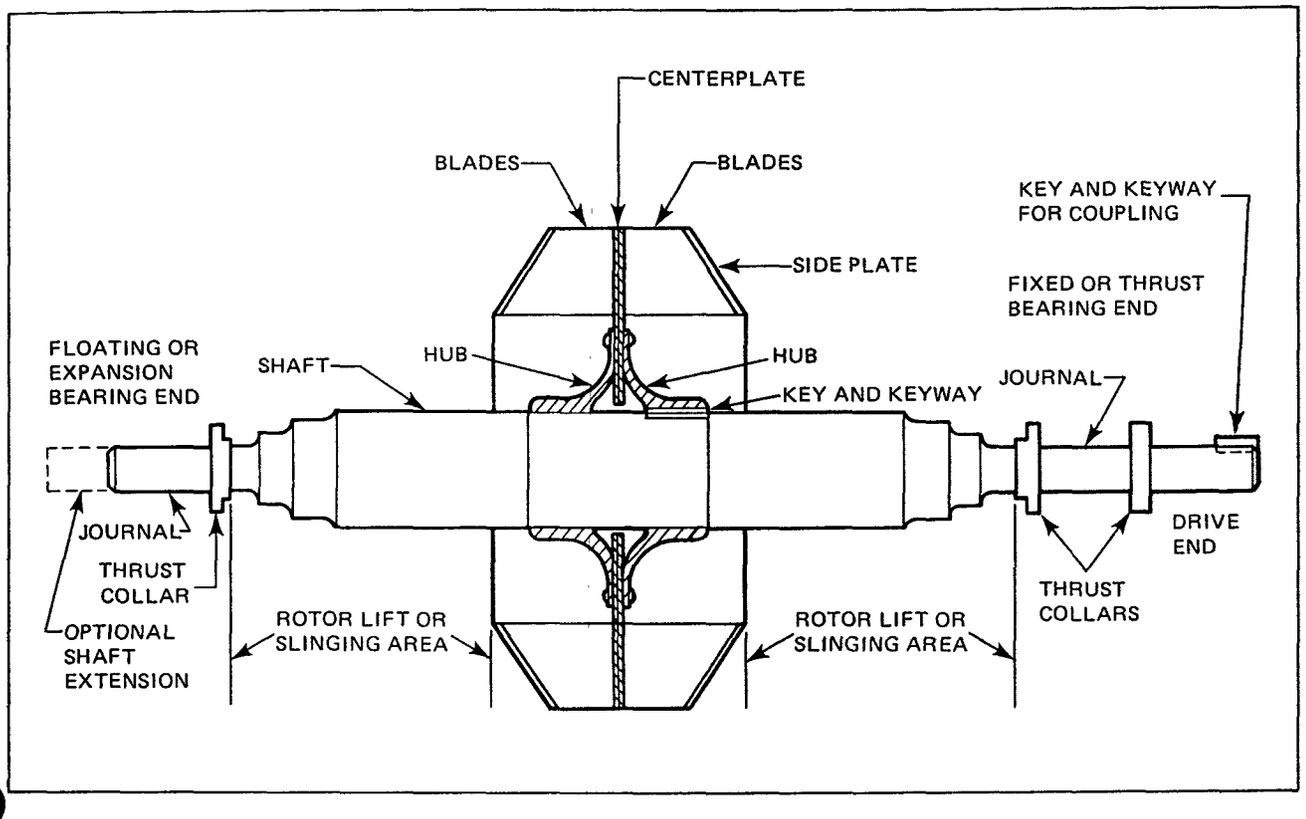



**Fig. 5.7.1-2** *Typical Rotor Component Identification*

determined from the Main Drive end as specified by customer. See Figure 5.7.1-3 for Rotation and Wheel Blade Types.

6. Identify and move Fan Inlets or Vane and Inlet Assemblies to their respective Rotor ends.

- Inlets without Vanes are interchangeable and can be assembled to either side of Double Width-Double Inlet Fan.

- Vane and Inlet Assemblies are NON-interchangeable, and must be installed on the correct side of fan. Refer to Section 8 - Inlet Vane Controls, Preparation for Installation.

**NOTE**

**Refer to Contract/Main Assembly Drawing for position of Vane Operating Lever. Vane Operating Lever must be in that approximate position when Vane and Inlet Assemblies are placed on Rotor.**

7. Guide Inlets or Vane and Inlet Assemblies on Shaft. Place in approximate installation position; support securely to prevent damage to equipment or injury to personnel.

**NOTE**

**Assure that all Non-Split Inlet Parts, such as Inlet Vane Control Seal Parts, are placed on Shaft in proper installation sequence.**

8. Pressurized Air Shaft Seals Only

Refer to Contract/Main Assembly Drawing, if Pressurized Air Shaft Seal Assembly is listed in Bill of Material; refer to Section 11.3 for seal details. (If not listed, proceed to Step 9.)

Seal Bodies are to be placed on the Rotor in their respective position to their location on the fans.

**CAUTION**

**SEAL BODIES HAVE MACHINED SURFACES AND MUST BE HANDLED WITH CARE.**

Insert a minimum of four (4) wooden wedges between machined Seal Body inside diameter and Shaft outside diameter and secure into position.

9. Install Bearings on Rotor. Refer to Section 6 - Bearings.

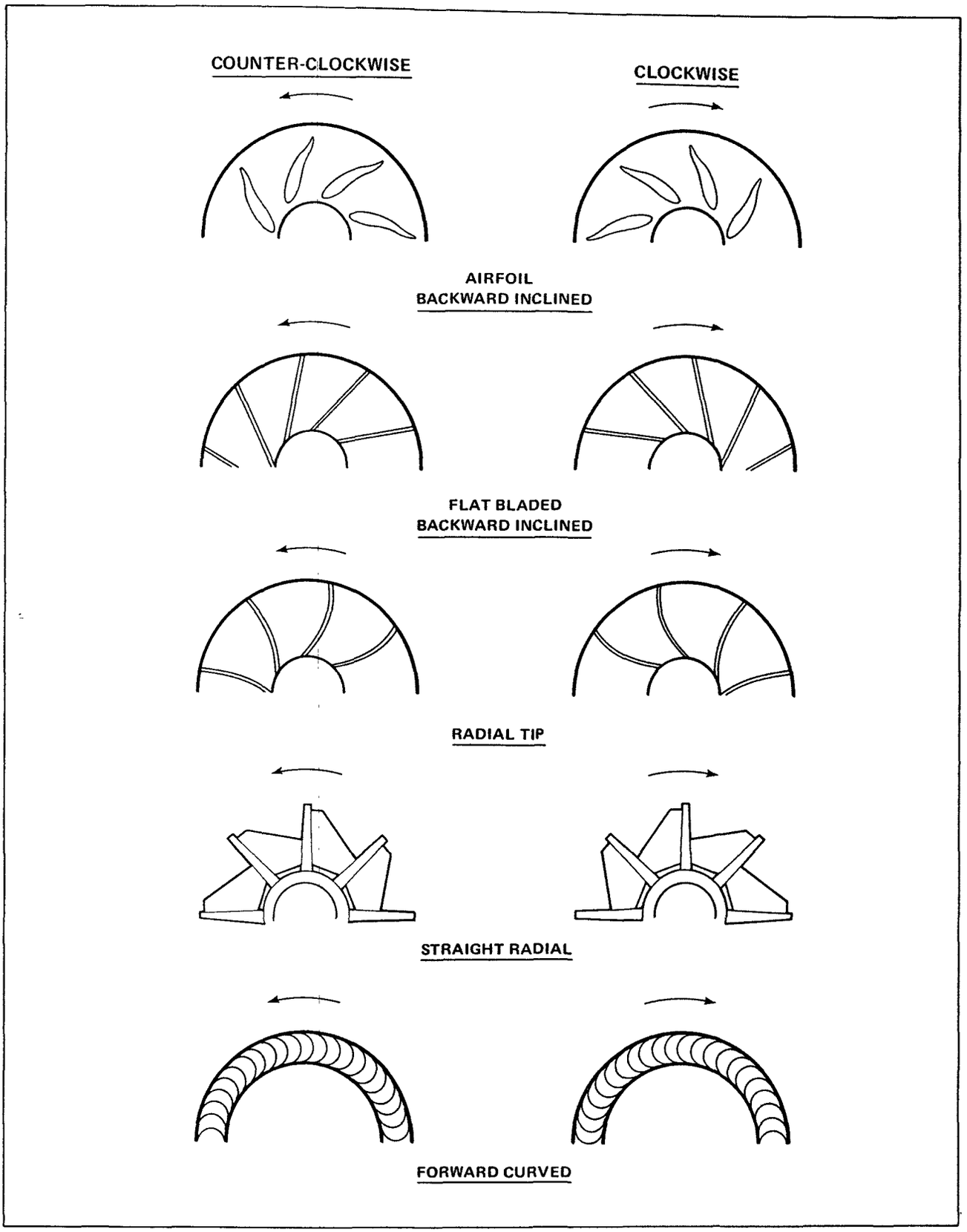


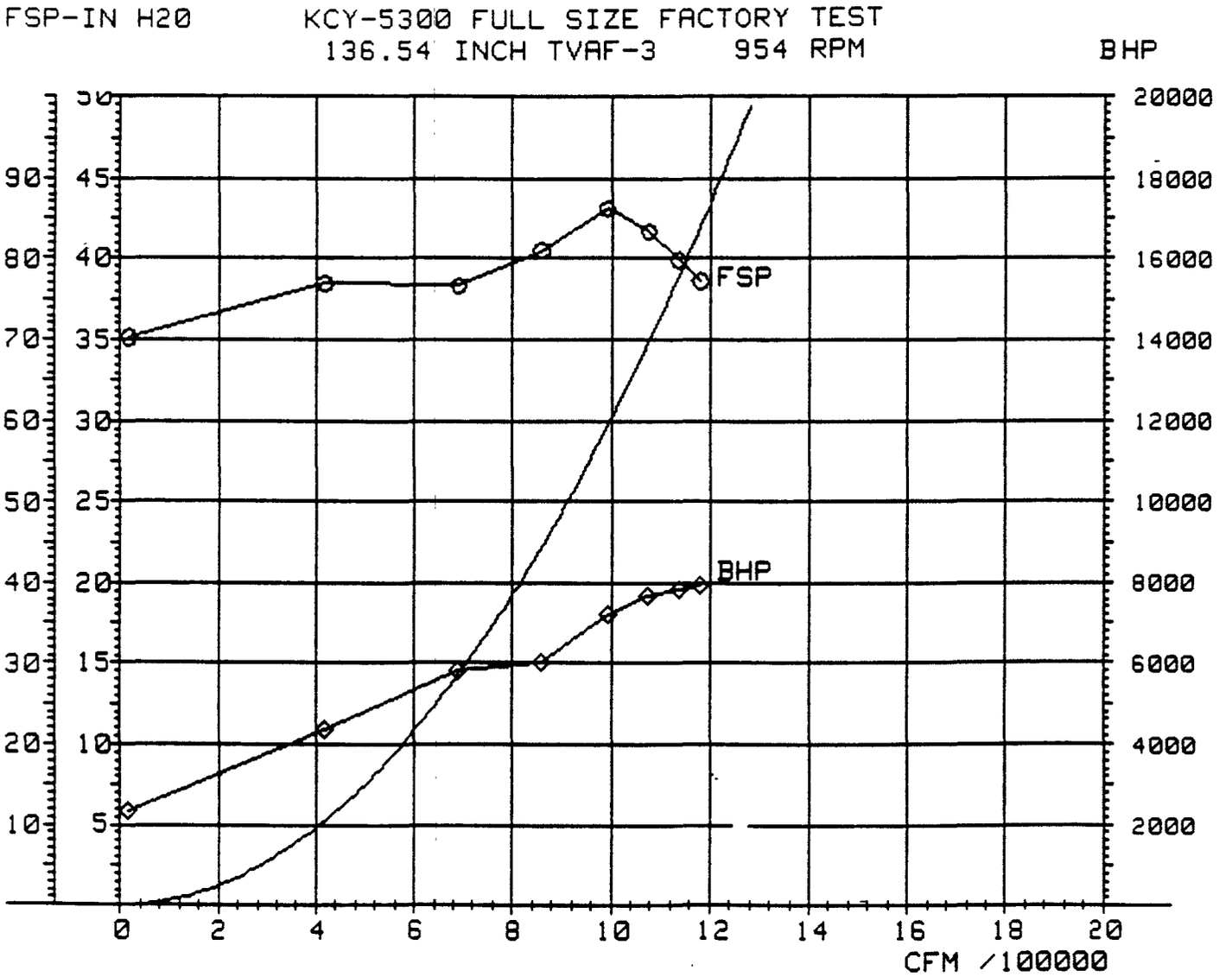

**Fig. 5.7.1-3** *Wheel Blade Types and Rotation*

TEST: 5300DC DATE: 08-28-83

KCY-5300 FULL SIZE FACTORY TEST. TVAF-3 DWDI 'B'. TEST RAN AT 318 RPM.

Fan Dia: 136.54 in Spd: 954 rpm Dens: .0409 lb/ft3 Flow Area:214.600 ft2

| # | CFM | HP | TP | SP | TE | SE |
|---|---|---|---|---|---|---|
| 1 | 16386 | 2347.094 | 35.136 | 35.136 | .0386 | .0386 |
| 2 | 417406 | 4368.252 | 38.578 | 38.456 | .5800 | .5781 |
| 3 | 690217 | 5795.344 | 38.650 | 38.320 | .7242 | .7181 |
| 4 | 857991 | 6039.418 | 40.997 | 40.494 | .9164 | .9051 |
| 5 | 991387 | 7196.582 | 43.781 | 43.114 | .9488 | .9343 |
| 6 | 1075839 | 7656.830 | 42.497 | 41.709 | .9394 | .9220 |
| 7 | 1137028 | 7828.016 | 40.805 | 39.922 | .9325 | .9124 |
| 8 | 1180221 | 7945.047 | 39.583 | 38.629 | .9251 | .9028 |



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